

Eshel III full setup

User manual assembly



Welcome to the world of the eShel III system

This document explains how to install your complete eShel III system.

Each component (spectroscope, guide cap calibration module) is covered in a separate, detailed manual.

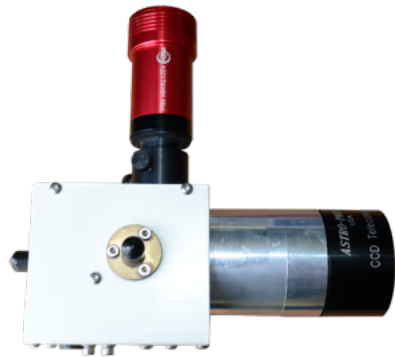
Enjoy the installation and make great observations!

Shelyak, October 2026



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The various subsystems of the spectrograph



The FIGU (Injection fiber module):

This subset includes the autoguiding camera (mounted and calibrated) as well as, if necessary, a focal reducer depending on your telescope's focal length, which should be similar to the focal length of the FIGU (F/6, F/7, or F/9, depending on the model ordered).

If your telescope's focal length matches that of the module, simply screw on the 2-inch barrel included with the eyepiece adapter.

You can install this subassembly on your telescope, making sure to align the module correctly along the right ascension and declination axes.



The FIGU allows the signal from either the target or the calibration module to be injected into the spectrograph's optical fiber.

The spectrograph eShel III :

This subassembly includes the spectrograph equipped with its spectral camera.

The spectrograph should be installed in a dark room with a stable temperature. It can also be installed in a temperature-controlled chamber, which will ensure more accurate calibration of the spectra.

It is connected to the FIGU via a 50 μm optical fiber.



2 optical fibers:

The system requires two types of optical fibers.

Be sure to correctly identify the **object fiber (50 μm)** and the **calibration fiber (200 μm)**. The part numbers are indicated on the FC/PC connectors.

Take all necessary precautions when handling optical fibers; they remain very fragile despite their stainless steel sheath. When they are not connected, keep the protective cap on the connector.



2 power supplies converting 110/220 V AC to 12 V DC:

Supplied with a power cord. These two power supplies are used for the calibration module and the high-voltage power supply.



High-voltage power supply:

Use this to generate the high voltage required for the thorium/argon hollow-cathode lamp.

Set the current correctly to 8 mA.

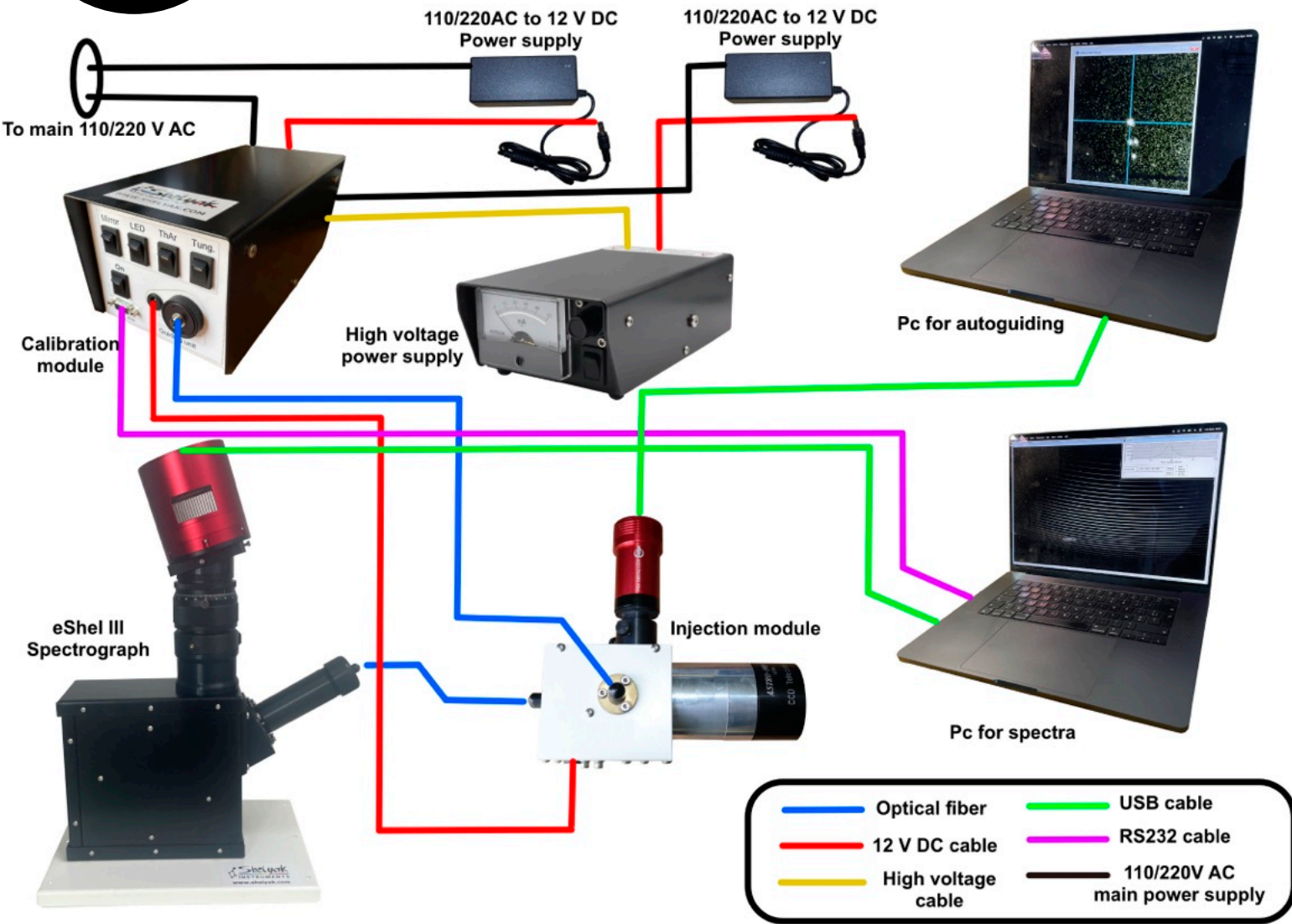


Calibration module:

The thorium/argon lamp must already be installed in the housing.

This module must be installed near the PC that generates the spectra, so that it can either be controlled locally (using the front-panel switches) or via RS-232 and thus connected to the PC.

2 Wiring Diagram



3 USB and RS-232 cabling

Connect the two cameras to the control PC using USB-3 cables:

- Autoguiding camera
- Spectral camera

Connect the calibration module to the control PC (to control it via software):

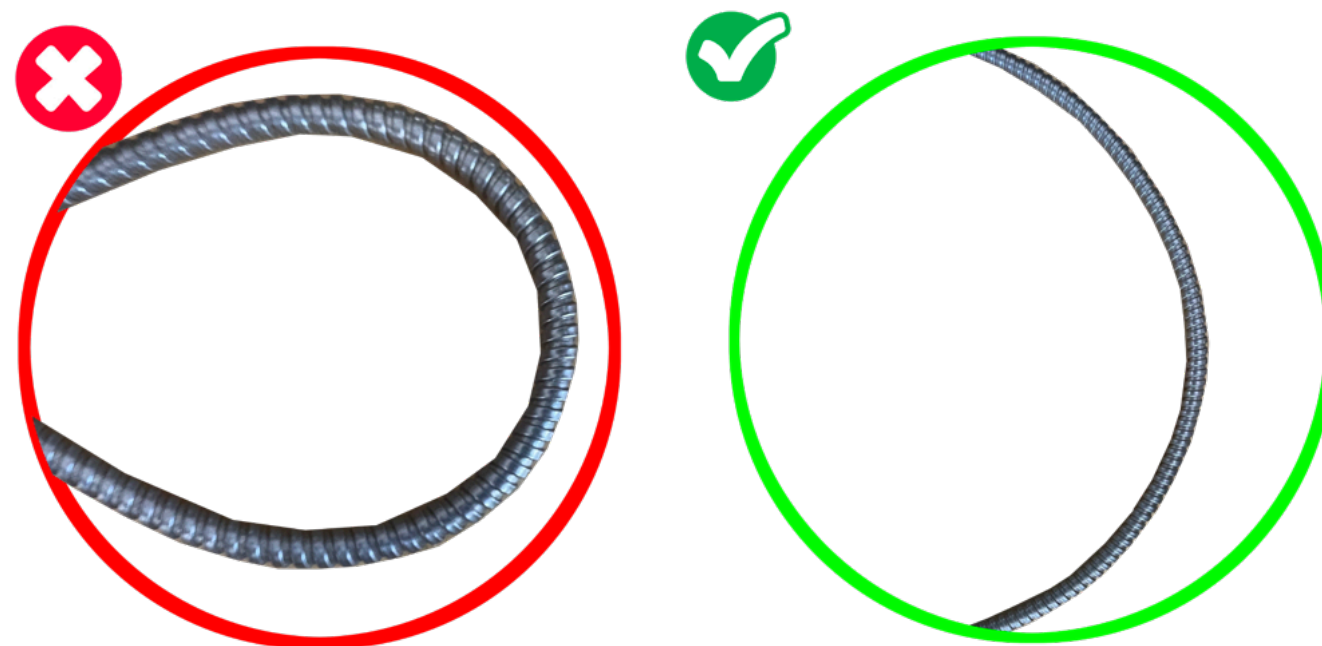
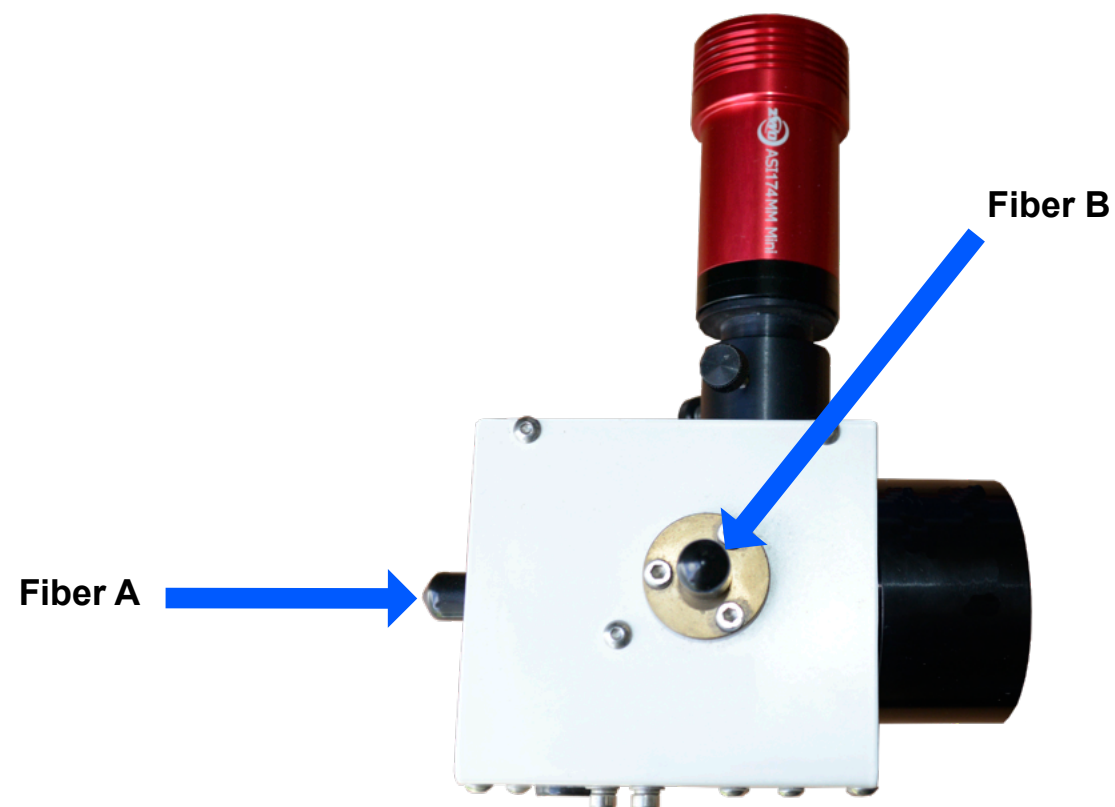
- Either using the supplied DB9 cable connected to a physical COM port
- Or using the DB9/USB cable connected to a virtual COM port

4 Optical Fibers

The 50 μm fiber must be installed between the eShel III spectrometer and the FIGU attached to the telescope (at location marked **A** in the photo below).

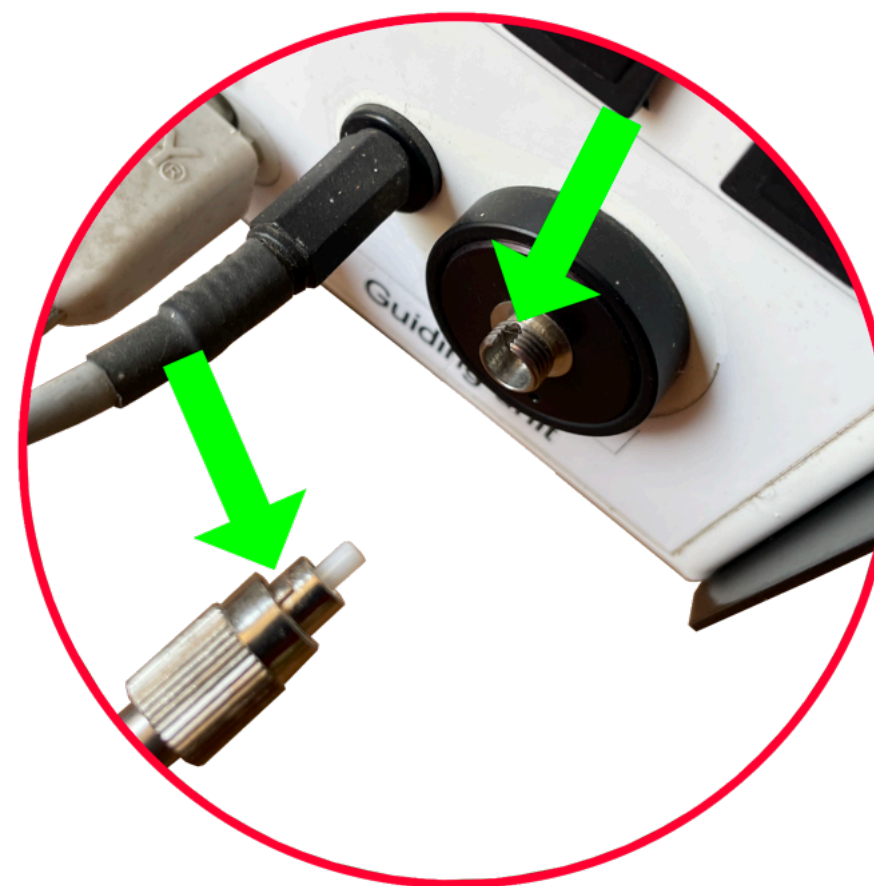
The 200 μm fiber must be installed between the calibration module and the FIGU attached to the telescope (at location marked **B** in the photo below).

The fibers must be routed carefully along the telescope to avoid any mechanical stress (check this for the various positions of the mount).



Be sure to make loops with a wide radius to prevent the fiber from breaking.

Each fiber has an FC/PC connector at each end, which must be screwed onto the female port of the spectrograph, the calibration module, and the FIGU.

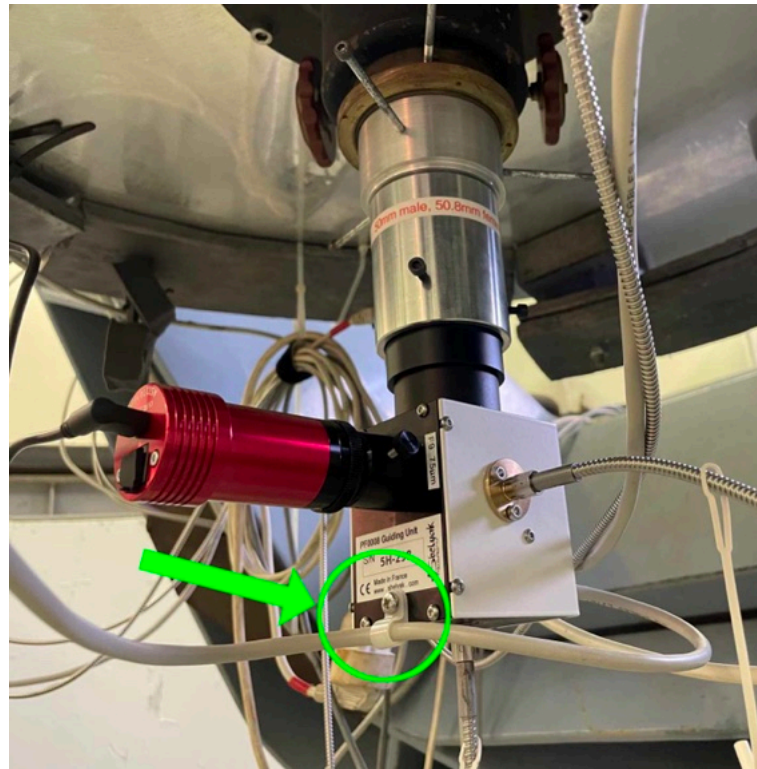


The male connector has a key that must be inserted into the female connector before screwing the connector in place. Be sure to check the alignment before screwing it in.

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12V cables

The calibration module controls the tilting of a mirror inside the FIGU to switch the signal between the object and the calibration source. To do this, connect the calibration module to the injection module using the power cable with two 5.5mm/2.5mm male DC connectors.



Feed the cable through the designated slot on the FIGU and plug the connector into the back of the FIGU.

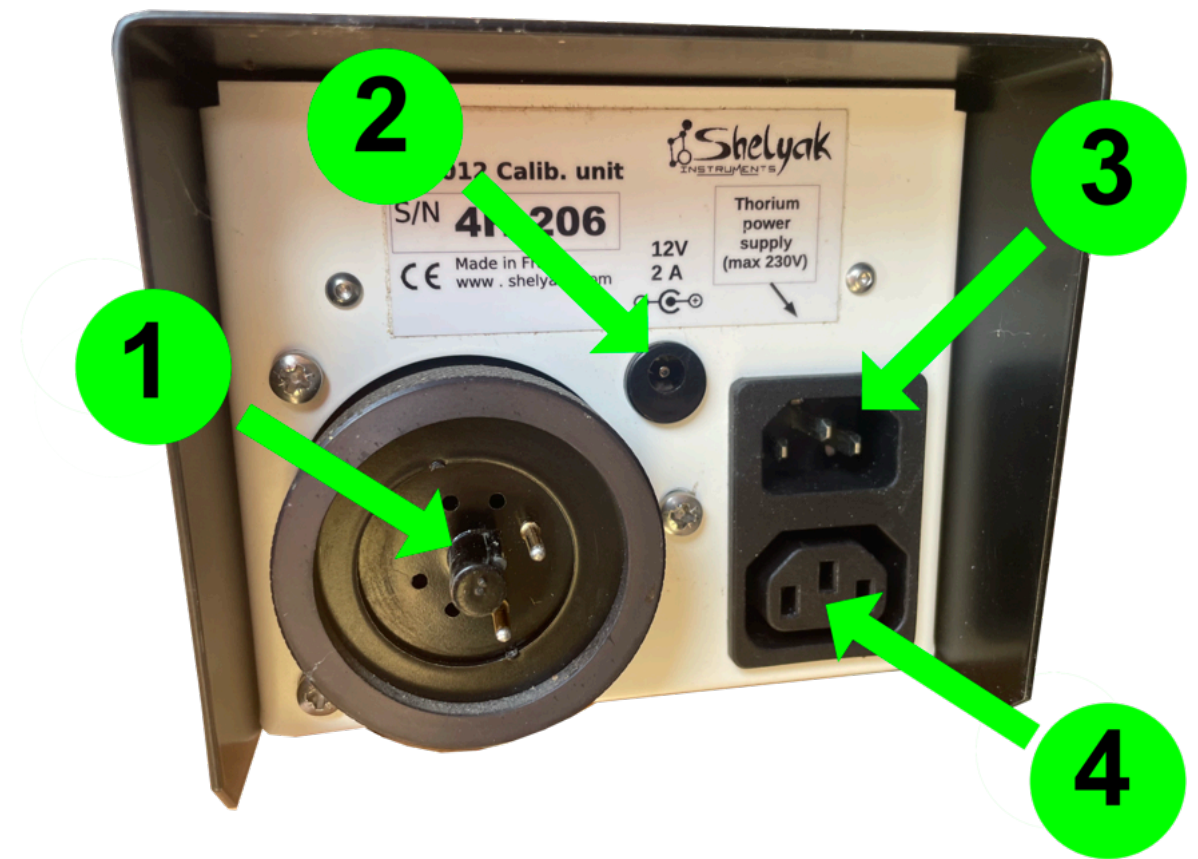
Connect the 12V DC output of the two 110/220V AC power supplies:

- To the back of the calibration module (Arrow #2 shown here)
- To the back of the high-voltage power supply

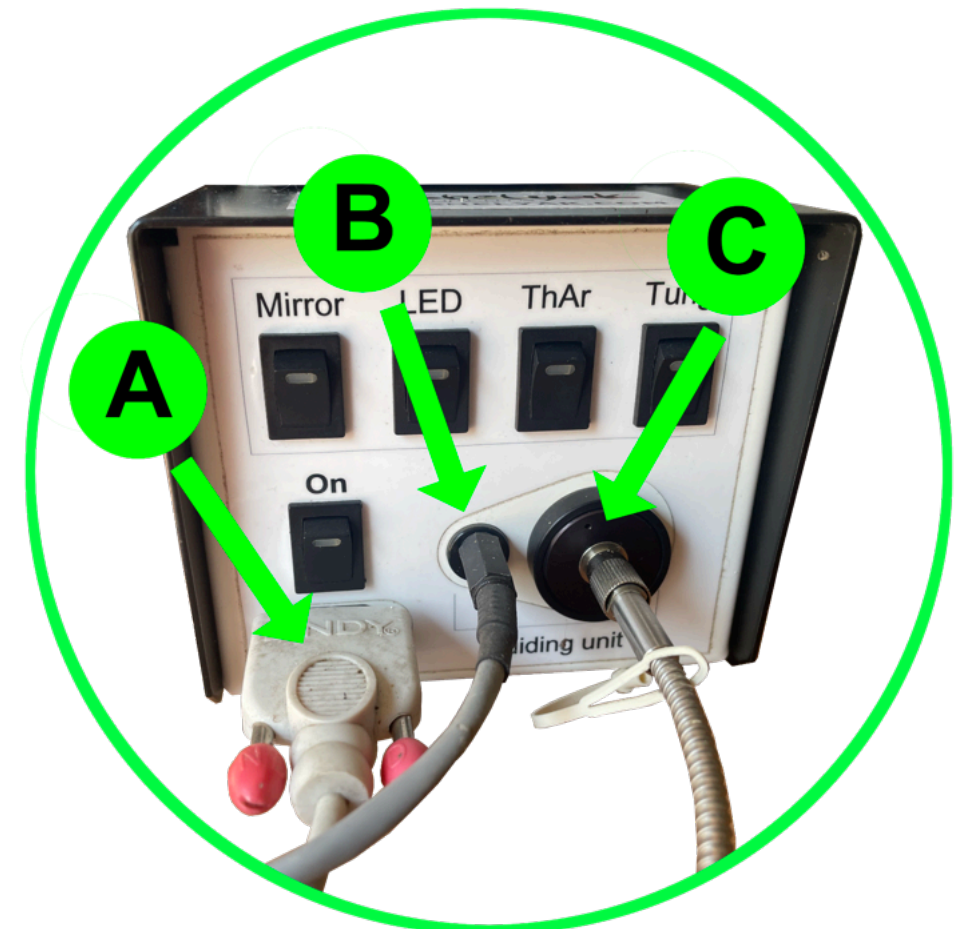
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110/220V and high-voltage power cords

- 1) Connect the calibration module's power cord (Arrow #3 shown here)
- 2) Connect the 12V power supply cable from the high-voltage power supply to the calibration module (Arrow #4 shown here).
- 3) Connect the 12V power supply cable from the calibration module.



4) Connect the high-voltage cable to the thorium/argon hollow-cathode lamp at the back of the calibration module (Arrow #1 above). This connector has a single orientation; it can only be inserted in one position.



Here is the front panel of the calibration module, equipped with various cables and fiber:

- A) 9-pin DUB RS232 connector (to the control PC COM port)
- B) 12V cable (to the FIGU)
- C) 200 μ m optical fiber (to the FIGU)



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